

The Commonwealth of Massachusetts

ANNUAL REPORT

OF THE

COMMISSIONER OF CONSERVATION

AND

STATE FORESTER

FOR THE

YEAR ENDING NOVEMBER 30, 1923

Mass. DEPARTMENT OF CONSERVATION



MAY 29 1924

STATE HOUSE, BOSTON

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MASS. OFFICIALS

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OUTLINE OF REPORT.

This report is divided for convenience and economy into four parts: —

- Part I. The organization and general work of the Department of Conservation.
- Part II. The work of the Division of Forestry.
- Part III. The work of the Division of Fisheries & Game.
- Part IV. The work of the Division of Animal Industry.

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The Commonwealth of Massachusetts

PART I.

ANNUAL REPORT OF THE COMMISSIONER OF CONSERVATION.

The conservation of natural resources has become an accepted policy and a clearly perceived matter of state and national welfare. Especially is this true with respect to the wise use of the forests. So far as Massachusetts is concerned, to the educational work of this department, supplemented by the untiring efforts of many public-spirited citizens and associations, conspicuous among the latter being the Massachusetts Forestry Association and the Boston Chamber of Commerce, is due much of the credit for this aroused public opinion.

Following the policy adopted when the department was first organized, and in accordance with the spirit of the act creating it, the Commissioner and the Directors of divisions (in their advisory capacity) have met at frequent intervals for the purpose of discussing departmental affairs. Fifteen meetings have been held and a complete record of the business transacted at these meetings has been kept.

CONSERVATION OF OUR FORESTS.

President Coolidge, in his first message to Congress, said: "Reforestation has an importance far above the attention it usually secures." And Governor Cox during the early part of the year, urging upon the towns the wisdom of establishing town forests, said in part: "Massachusetts should do its share in restoring the forest to our idle lands and it seems that in this way the importance of the subject can best be brought before the citizens of the Commonwealth."

Further evidence that the vital importance of a constructive forest policy is clearly recognized is given by the action of the United States Senate in appointing a committee to make a careful study of the forestry situation throughout the country and to report its recommendations to Congress. This committee held a hearing at the State House in Boston, September 22, which was attended by the State Foresters of all the New England states, also, representatives of many of the leading wood-using industries of New England. The members of this committee seemed deeply impressed by the statements of the several speakers with respect to conditions in New England, both as to the imperative need of reforestation and the necessity of adequate fire protection.

As a result of the searching investigation of this committee, its Chairman, Senator McNary of Oregon on December 15th introduced a bill into Congress, Senate No. 1182, embodying the recommendations of the committee. The outstanding features contemplated by this bill may be summarized as follows:— It provides for cooperation between the Federal Government and the various states in forest fire protection with a special reference to watersheds; the devising of forest tax laws designed to encourage timber growing on the part of private land owners; for the promoting of practical methods of insuring the standing timber on forests from losses by fire; the cooperation of the Federal Government with the various states in the distribution of tree seeds, and plants to be used in the development of forests upon wild and waste lands. An appropriation is provided to be used in cooperation with the states in advising and assisting land owners in the management of farm woodlots. The bill also provides for the enlargement of national forests wherever such increase will tend to protect navigable streams or any waters suitable for irrigation purposes. If this bill is enacted into law and the policy contemplated by it strictly adhered to, it cannot fail to make a very substantial increase in timber production.

CONSERVATION OF WILD LIFE.

The dependence of wild life on a suitable environment has been fully shown in the changes which have taken place in this Commonwealth since the days of the early settlers. It has been argued rather facetiously that agriculture kills no game,

but the doctrine cannot make headway in this State. One has only to refer to the large areas of water and land formerly suitable to wild fowl which today exist largely in the shape of cranberry bogs, or to the large stretches of land which have been brought to such a high degree of cultivation that under the mantle of a winter's snow offer not the slightest refuge or feeding ground, or to areas so denuded of trees as to remove the natural habitat of other forms of wild life. These conditions are likely to become more unfavorable before there is a swing in the opposite direction.

It is an elementary principle in the work of conservation that the best results can be obtained only when complete control over given areas may be exercised — to the end that the land may be protected against poachers, vermin systematically destroyed, and conditions made favorable to support the largest possible population of desirable forms of wild life. Taking the State as a whole, there is such absence of necessary central control as to cause one to marvel that so much wild life is to be found today in the face of adverse conditions. Few owners of land give any thought to the welfare of wild life as part of the plan of development. All other material interests are first served. Should it develop that such activities are not injurious to wild life — all well and good, otherwise the species remaining take up the fight for existence against greater odds. The people are beginning to realize more and more the dependence of wild life on proper environment and the importance of forests in supplying it. While forests for lumber and fuel may be the slogan of the hour, thousands of people are beginning to chant the additional words "and for the protection of wild life." It is to the everlasting credit of the inhabitants of the State that through the acquisition of additional lands each year there is an increasing guarantee of more favorable conditions for at least a portion of our birds, quadrupeds and fish. The time has come when the principle should be extended to the acquisition of some lands which are more valuable as wild life sanctuaries than some areas acquired primarily for reforestation purposes — but upon which a certain amount of reforestation can annually be carried on. The perpetuation of the wild life of the State will never be assured until a reasonable number of such permanent sanctuaries are established generally throughout the public domain.

The work of the Division of Fisheries and Game was conducted without any special innovations, along lines laid down in previous years. Special attention has been directed toward the increase of output of bird farms and fish hatcheries, at a less cost of production. The success of any State activity depends very largely on the volume of workable public sentiment behind it. It is safe to say that there never was a time in the history of the State when the people who do not hunt but are interested in the outdoors, the sportsmen, fishermen and landowners were as united to bring about permanent benefits as they are today.

CONSERVATION OF DOMESTIC ANIMALS.

The relation of our domestic animals to public health, to production of food and raiment, to agriculture, and to many lines of commercial industry, imposes the necessity of applying all the principles of conservation to the maintenance of this relation at a standard which its importance calls for in the whole scheme of public welfare.

When we consider that certain of our domestic animals furnish a large portion of our food supply by their products during life and by the utilization of their carcasses when slaughtered, that they are the original factors in the production of raiment for the people, that successful agriculture is not possible without them, that many lines of business are dependent upon their use as toilers on the farm or servants in transportation, and that modern day progress in scientific protection of the public health is being rapidly accomplished by their use in the laboratory, it can readily be seen that the function of the Division of Animal Industry, in the control and eradication of contagious diseases of these animals and supervision of the sanitary conditions under which they are maintained, if efficiently executed, is one of true conservation of valuable resources.

This Division is now doing extensive work in the eradication of bovine tuberculosis by the use of the tuberculin test. This work is of great value not only

in the improvement of health conditions of live stock, but also in lowering the incidence of human tuberculosis due to bovine origin. This branch of the Division's service has developed very rapidly since the passage of the so-called tuberculin testing law, and it is receiving the strong support not only of the cattle owner who has a laudable desire to eliminate disease from his animals, but also of public health officials who see a great step forward toward protection of the health of the people by further purification of the milk supply.

Certain additional legislation seems necessary in order that this service may function to the limit of its possibilities in conservation of human and animal life. The prompt slaughter of clinical cases of bovine tuberculosis should be aided by enactment of legislation which should induce their being reported to officials of the Division. This can only be brought about by a compensation law providing reimbursement to their owners.

The sale of animals shown by the tuberculin test to be diseased for any other purpose than slaughter should be prohibited, which would in a large measure prevent the spread of the disease from farm to farm. The regulatory measures recently put in force at the Brighton stockyards, the only public cattle market in this State or in New England, under which measures no tuberculous cattle can be sold whether their origin be Massachusetts farms or those in other States, should be looked upon as a potent factor in the control and eradication of the disease, and any effort directed against these measures by commercial interests should be promptly opposed for the public good.

We refer to the accompanying report of the Director of Animal Industry for recommendations for legislation and for a detailed description of the service of this Division.

FOREST FIRES.

Coincidental with the development and wise use of the forest must be its protection from fire. While the annual loss from forest fires in Massachusetts has been greatly reduced from what it was in former years, the problem is still one of serious moment. It is difficult to put into accurate figures the loss sustained from forest fires. Such estimates usually include the value only of the wood and timber destroyed, no account being made of the injury to the soil, which in many instances is of such nature as to retard for many years the young growth.

Our fire protective system has been developed with three basic principles in mind; first, the use of every reasonable measure of precaution to prevent fires and as carefully compiled records show that 95% of those that have occurred in Massachusetts during the past fifteen years were caused by carelessness, we are continually attempting through publicity methods to arouse public opinion to a complete realization of the necessity of using care to prevent fire. The second problem involves the prompt detection of them when in their incipient stage which is very effectually accomplished by the operation of our system of observation towers, and the third and vitally important need is an organized force of experienced men properly equipped to be on the ground at the earliest possible moment after the fire has started to extinguish it. With our district forest wardens, the town forest wardens and their deputies, we now have a very effective organization.

STATE FORESTS.

The purchase of land for state forests has progressed during the year to the extent of acquiring 11,577 acres. This land is distributed as follows:

Harold Parker State Forest,	105 acres
Savoy Mountain State Forest,	382.3 acres
Beartown State Forest,	1,228.6 acres
Colrain State Forest,	330.89 acres
Conway State Forest,	475.18 acres
Erving State Forest,	1,448.3 acres
Leominster State Forest,	384.25 acres
Mohawk Trail State Forest,	356.5 acres
Oakham State Forest,	88 acres
October Mountain State Forest,	634.3 acres

Sandisfield State Forest, 1,079.5 acres
 Shawme State Forest, 122 acres
 Tolland-Granville State Forest, 222 acres
 Wendell State Forest, 549 acres
New State Forests
 Hawley State Forest, 850 acres
 Otis State Forest, 885 acres
 Worthington State Forest, 225 acres
 Unassigned Lots, 2,211.8 acres

Additional land for state forests now in process or contemplated for acquisition comprises approximately 22,000 acres.

STANDISH MONUMENT RESERVATION.

The damage to the statue of Capt. Myles Standish caused by the electrical storm of August 26, 1922 has not yet been repaired because of insufficient funds. It is hoped that the General Court during its next session will provide the money necessary to restore the monument to its original form.

The interest and sentiment felt for this historic reservation is attested by the fact that during the season beginning May 29, 1923 to October 28, over 50,000 people visited the reservation. According to the register made by Wilfred C. Dawes, in immediate charge of the grounds, there were visitors from every state of the Union, also from Alaska, Philippine Islands, Honolulu, Cuba, Porto Rico, Bahamas, Bermuda, every Province of Canada, Mexico, Tokio, Japan, Pekin and Hong Kong, China, Sydney, Australia, Soi, East, Africa, several places in Russia, Norway, Denmark, Sweden, Scotland, Ireland, England, Paris, France, Germany and Newfoundland.

WHITE PINE BLISTER RUST.

The work of controlling the spread of the disease is in the hands of the Department of Agriculture, except where it is done on our state forest lands. A forestry report would hardly seem complete unless it contained some account of the statewide work of blister rust control. For this reason we have asked Mr. C. C. Perry, Agent in charge of blister rust work, to submit a brief summary of the year's activities, which follows:

"The following is a summary of white pine blister rust control work in Massachusetts as conducted by the Division of Plant Pest Control, Massachusetts Department of Agriculture, in coöperation with the Office of Blister Rust Control, Bureau of Plant Industry, U. S. Department of Agriculture.

Educational work has been conducted by the federal blister rust agents in all districts except Berkshire, although intensive work has been confined to six districts, namely, Essex, Plymouth, Worcester (South), Worcester (North), Franklin, and Hampden. The educational work has consisted primarily of personal interview work with pine owners and others, supplemented by the holding of special meetings with talks on blister rust, placing of special exhibits in local stores and at the regular agricultural fairs, conducting demonstrations to individuals and groups, and the publication of blister rust items in local news publications.

No special effort has been made to locate new areas of infection although in conducting the regular field work infected pines have been found in 18 additional towns. This brings the number of towns in which pine infection has been found to a total of 142. A particularly striking infection area was found in Ashburnham, another in Spencer, both in Worcester County. Several new areas were found in Plymouth County, also in Hampden. Infection in southern Berkshire County is very general.

Control work was started for the season on April 16 and discontinued in most sections on September 15, a small amount of work however, continuing until October 15. This work has been conducted upon the same general lines as last year except that in some districts (Worcester South and Essex) where last year the state assumed the entire responsibility of securing the areas, this year an attempt has been made to have the owner assist in the preliminary work as well as with the actual eradication of *ribes*. This plan has been quite successful and

will be attempted on an even broader scale another season. In sections where *ribes* are very scarce the entire expense of scouting has been borne by the state. Control work was performed in each of the nine districts in the state including Berkshire County, although no educational work was conducted in that county."

The following gives a summary of the work.

NUMBER OF MEN EMPLOYED.

The State employed 1 Checker of field work, 24 Inspectors (full time), 5 Inspectors (temporary), 17 Laborers (part time only).

The number of wild *ribes* pulled was 1,558,107 and the number of cultivated *ribes* pulled was 14,977, making a total of 1,573,084.

The total expenditures by co-operators amounted to \$6,894.90 and the total expenditures by state (all work) amounted to \$16,050.53, making a total cost of \$22,945.43. The average cost per acre was 11¢.

LECTURES AND CONVENTIONS.

There has been no abatement in the requests for lectures dealing with the subject of forestry and related topics. It is pleasing to note that the majority of these requests are received from business organizations, such as Boards of Trade, Rotary and Kiwanis Clubs, which fact indicates a lively interest on the part of the every-day business man in the activities of this department.

During the year the Commissioner and his assistants gave eighty-three lectures. In addition to the above, the Commissioner attended the following conventions:—

Association of State Foresters, Harrisburg, Pa.

American Fish & Game Association, Harrisburg, Pa.

Massachusetts' Tree Wardens and Foresters' Association, Boston, Mass.

New England Section of American Foresters, Greenville, Me.

During the summer the Commissioner visited England, and acting under authority given him by His Excellency, Governor Cox, devoted several weeks' time to the study of forestry conditions and the methods practiced by that Government in promoting the forestry interests of that country. The attention and information generously given him by the British Forestry Commission was extremely valuable and deeply appreciated.

RECOMMENDATIONS OF THE DEPARTMENT OF CONSERVATION.

Division of Forestry.

1. *Prevention of Forest Fires.* While the operation of the forest fire prevention system has been productive of gratifying results, the Commissioner is convinced that the laws under which it was created can be so amended as to make it far more effective in the future. When it is considered that the department has already acquired in the name of the Commonwealth approximately 65,000 acres of land for forestry purposes, and will continue to acquire land for that purpose for several years to come, it becomes apparent how essential it is to afford the greatest amount of fire protection possible.

Under existing statutes in towns, forest wardens are appointed by the selectmen and in cities by the mayor and aldermen. These wardens have sole charge of the prevention and extinguishment of fires which occur within their respective towns. Inasmuch as the State Forester is charged in a general way with the control of forest fires throughout the state, it seems logical that he should be given more power with respect to the creation of a fire-fighting organization.

It is, therefore, recommended that the appointment of these forest wardens be given to the State Forester.

The Commissioner is also of the opinion that the cost of extinguishing fires should be divided between the State and the County in which the fire occurs. Past experience has shown that while many towns consider the cost of fighting forest fires a serious burden, some towns even find it practically prohibitive. Obviously, the forested areas of the state are found in the towns with the smallest valuation and in such towns there is a reluctance to expend an adequate amount of money in fighting forest fire.

As forests are a distinct advantage to a county and are enjoyed by all its people, it seems only just that the entire County should share in the necessary cost of protecting them.

Under existing statutes railroads are required to pay the cost of extinguishing fires set by them on grass lands or forest lands, and the Commissioner believes that the same liability should be imposed upon any person or corporation operating lines for the transmission of electricity or engaged in the construction or repairs of highways.

2. *Salaries of Directors.* Owing to the steady growth in the volume of business in both the Division of Fisheries and Game and Animal Industry, it is the opinion of the Commissioner that the Directors of those divisions are not receiving salaries commensurate with their duties and responsibilities. The Commissioner, therefore, recommends an increase of salary in each instance.

Division of Fisheries and Game.

1. *Relative to Hunting and Fishing Licenses.* The law should require a fishing license in all inland waters (in which Nantucket and all ponds now fished commercially under lease from the Director are excepted). Under existing law, a license is not required to fish in inland waters which have not been stocked since January 1, 1910. It has been a physical impossibility to stock all of the inland waters in order to do away with this distinction. It, in effect, means that the waters most recently stocked are given protection, and that the waters which have not been stocked recently (and which presumably need it most) are left without any protection. This bill will also repeal Section 15 of Chapter 131 of the General Laws which calls for a publication of the list of stocked waters. By repealing this section we will be saved the expense of publishing this list annually, to say nothing of eliminating the work connected with it. We believe the sentiment in the State is — that all fishermen should pay their share of the freight. This bill will also repeal Section 11 of Chapter 131 of the General Laws. This section provides for the issuance of duplicate licenses to replace lost licenses. In order to simplify bookkeeping, and to make license holders more cautious, the repeal of this section would require the licensee to purchase a new license. At present the loser of a license must make an affidavit as to the loss, sending it to the State House before obtaining a new license.

2. *Relative to the Date of Expiration of Lobster Licenses and to the Revocation of Such Licenses.* At present the lobster licenses expire on November thirtieth. All other licenses issued by this Division expire on December thirty-first and it is desirable to have all licenses expire on the same date to make the office records uniform. This bill also provides for the revocation of a license in the event of certain violations, with the effect of putting the violator out of business for a year from the date of conviction. As the law now stands, no license can be revoked unless the holder has been twice convicted of certain specific violations. If he is convicted of fishing without a license there is nothing to prevent him from obtaining a license and resuming his work. The change provides for the revocation of his license upon conviction of a violation of any of the lobster laws, except that, in the matter of having short lobsters, conviction shall not result in such revocation unless — per cent of the lobsters shall consist of short lobsters. It also provides that upon conviction for fishing without a license, — no license can be obtained within a year from the date of conviction. We believe that every lobster fisherman who honestly desires to maintain and build up his means of livelihood will see the reasonableness of these safeguards.

3. *Relative to Damaging Property while Hunting, Trapping or Fishing.* The great majority of hunters, trappers and fishermen want to obey the law and treat the other man's property with the same consideration which they would show to such property were it their own. A small class of bad actors is constantly stirring up ill-feeling between landowners and the public. We want to help to hold this class in subjection. Nothing (outside of a jail sentence) will be as effective as the revocation of the hunting or fishing license which would result from a conviction under this proposed law.

4. *Relative to Fishing in Inland Waters.* The law should reduce the number of traps in winter fishing from ten to five to each fisherman. This is the only further

legislative restriction on winter fishing we propose. We are still of the opinion that the present open season of winter fishing is too long and too deadly. But we have decided to watch the results of recently imposed restrictions to see if the benefits are sufficient before advocating more than the above.

5. *Investigation by a Special Commission relative to Public Hunting and Fishing Grounds and Game Refuges.* It is desirable to create a commission of five members to consider the establishment of a public shooting ground. Likewise a public fishing ground to be located on the banks of some river or stream and to report to the Legislature of 1925 its recommendations thereon. There is a great amount of waste land only partly suitable for reforestation which could be utilized for this purpose with no loss to agriculture. The same is true of fishing grounds. But such a commission could study the project in all its phases and report on what should be done, if anything, to establish such public properties in this State.

Division of Animal Industry.

1. *Payment for Cattle condemned and killed because affected with Tuberculosis.* A condition which now threatens to offset in a large measure the progress being made in the eradication of bovine tuberculosis under the provisions of Chapter 353 of the Acts of 1922, approved May 2, 1922, and known as the tuberculin-testing law, is the operation of section 4 of that Act, which provides that on and after August 1, 1923, section 12 of Chapter 129, as amended by section 2 of Chapter 353, should be repealed.

Said section 12 of Chapter 129, General Laws, is the statute under which, until its repeal (Aug. 1, 1923), the Commonwealth paid for cattle condemned and killed because affected with tuberculosis, and the operation of which resulted in the slaughter of many badly diseased animals so far advanced in the stages of tuberculosis as to be readily recognized by their owners and by local inspectors. They then became subjects for immediate quarantine, which was followed by their condemnation and killing under orders of the Director of Animal Industry.

An owner of such an animal would always report its condition to his local town inspector or direct to the Division of Animal Industry, knowing that official condemnation and killing meant the payment of a certain amount of money as a partial reimbursement for his loss. As soon, however, as State indemnity was withdrawn by the repeal of this section of law, the attitude of the owners of this class of animals immediately changed. They now, in many instances, fail to report them, as nothing is to be received from the State as reimbursement, and the disagreeable publicity of quarantine is avoided.

What now happens in such instances is that a badly diseased tuberculous cow is kept milking as long as possible, and in the meantime she is rapidly spreading the disease to other cattle, not to mention the possibility of its spread to the human subject. The final disposal of such an animal is death from the disease, slaughter by the owner, or sale at whatever price she will bring in the market. In the latter case there is the extension of a center of infection to another location, other cattle are exposed, and possibly other human lives jeopardized.

Before the law referred to was repealed these animals, as stated, were reported, then quarantined, killed and paid for; further, — members of the same herd were examined for additional cases, and the premises were cleaned and disinfected. These measures undoubtedly limited to a large degree the spread and prevalence of the disease, were measures of sound economy, and immeasurably effective in protection of the public health.

Upon repeal of the law providing for reimbursement for this class of cases, we found their number reported to official authority immediately dropping 75 per cent. This means that a large per cent of the badly diseased tuberculous cows in the state are continuing to live and spread the infection. In my opinion it would be far better for the Commonwealth to pay something for these creatures, and have them condemned and killed. This would be of itself a measure of true economy and would certainly be greatly in aid of the present movement to eradicate tuberculosis by use of the tuberculin test.

The Commonwealth is now spending large amounts of money to eradicate the disease by scientific methods, and to allow active spreaders of the disease to exist

because of no practicable law by which to exterminate them would seem to be a paradoxical condition which should be remedied.

I therefore recommend the enactment of legislation whereby the present condition, brought about by the repeal of section 12, Chapter 129, General Laws, may be eliminated.

A bill embodying the above recommendation is herewith submitted.

2. *Restricting the Sale of Cattle which have reacted to a Tuberculin Test.* A condition operating directly against the eradication of bovine tuberculosis by use of the tuberculin test, in accordance with the provisions of Chapter 353, Acts of 1922, is the indiscriminate sale of animals which have reacted to such test.

Chapter 137 of the Acts of 1922 places certain restrictions on the sale of this class of animals, but does not absolutely prohibit it. Consequently there is more or less traffic in them, resulting in spread of the disease from one farm to another.

In my opinion the owner of an animal which has reacted to a tuberculin test should not be allowed to sell the same except for purposes of immediate slaughter. If he desires to retain such an animal in his own herd he alone should assume the responsibility, be the consequences what they may, but the public should be protected against the consequences of this traffic in diseased animals.

It is my opinion that the expenditure of money by the Commonwealth to eradicate bovine tuberculosis is rendered more or less futile if the disease is allowed to be carried from one farm to another by the sale of animals known to be affected therewith.

I therefore recommend that said Chapter 137, Acts of 1922, recorded as Section 33A of Chapter 129 of the General Laws, be so amended as to prohibit the sale of reacting cattle except for immediate slaughter.

A bill embodying this recommendation is submitted herewith.

PART II.

REPORT OF THE DIVISION OF FORESTRY.

Affecting as it does the well-being of our citizens and the whole industrial life of the Commonwealth, the work of this division in promoting the forestry interests of the Commonwealth has constantly become more popular and its activities steadily on the increase. The activities of this department include the giving of technical advice in regard to the proper management of forest lands to private owners, the development of nurseries, the planting of state-owned lands, operating a fire prevention system and the suppression of the gypsy moth, the accomplishments in each being more fully described elsewhere in this report.

NEW LEGISLATION.

For several years under existing statutes the Commonwealth has been extending financial aid to certain towns in defraying the cost of fighting forest fires. The aid so rendered, however, was not sufficient in the case of towns with small valuations to induce their best efforts. Therefore, to further encourage fire fighting in such towns, legislation was enacted based upon the recommendation of the Commissioner increasing the aid so given.

The several laws under which land for state forests is acquired were so amended as to make them alike in matters of detail without making any substantive changes.

For the purpose of more effectually securing the preservation of a locality of scenic beauty, an act was passed authorizing the Commissioner of Conservation to accept on behalf of the Commonwealth a gift of land of five acres situated in the town of New Marlborough. On this small reservation is a beautiful waterfall, one of the most picturesque in New England, known as Campbells Falls. The State of Connecticut has also been given land located in that state which joins the above tract. It will be preserved as a reservation for the benefit of all the people. The expense incident to its maintenance will be borne by the State of Connecticut.

ORGANIZATION.

WILLIAM A. L. BAZELEY, Commissioner and State Forester
 CHARLES O. BAILEY, Secretary
 HAROLD O. COOK, Chief Forester
 D. C. A. GALARNEAU, Ass't Forester in Western Massachusetts
 FRANK L. HAYNES, Ass't Forester, Land Purchase
 JAMES MORRIS, Ass't Forester, Nurseries
 ROBERT B. PARMENTER, Ass't Forester, Mapping and Reforestation
 MAXWELL C. HUTCHINS, State Fire Warden
 GEORGE A. SMITH, Moth Superintendent

District Forest Wardens.

1. James E. Moloy, Woburn
2. John H. Montle, Fall River
3. Jos. J. Shepherd, Pembroke
4. John P. Crowe, Westborough
5. Albert R. Ordway, Westfield
6. Jos. L. Peabody, Winchendon
7. Verne J. Fitzroy, Savoy

District Moth Superintendents.

1. Michael H. Donovan, Beverly
2. William A. Hatch, Marlborough
3. John J. Fitzgerald, Haverhill
4. Clarence W. Parkhurst, Foxborough
5. Walter F. Holmes, Buzzards Bay
6. Harry B. Ramsey, Worcester

STATE PLANTATIONS.

One new lot of 35 acres was planted in addition to completing two others and filling in another which had been burned. In all, 75,000 transplants were set out during the months of April and May. Conditions following the planting were so dry that the plantations were not as successful as in former years. These lots will be restocked as soon as possible.

Liberation cuttings were made on two lots, and eradication of ribes carried on on several others. It has been brought to our attention that several of our plantations are infected by blister rust, but with eradication work done effectively, we can hope to keep this disease out. We especially urge all prospective planters of white pine to eliminate all currant and gooseberry bushes within the borders of the area to be planted, and also, if possible, for a distance of 200 yards surrounding the lot. The following is a list of the lots worked on during the past year, giving the name of the lot, location, and work done.

Morton, Freetown — 13,000 trees planted.

Pierce, Myricks, 33,000 trees planted.

Chestnut Hill, Spencer — 10,676 Ribes eliminated.

Lawrence, Fitchburg — Liberation cutting (27 acres).

Smith, Ashburnham — Brush disposal (10 acres), 98,474 Ribes eliminated.

Dean, Oakham — 10,000 trees planted.

Schoonmaker, Ashburnham — 33,000 trees planted, Brush disposal (80 acres).

Glebe, Hopkinton — Brush disposal (108 acres).

Lawrence, No. Ashburnham — Brush disposal (63 acres).

Coughlin, No. Ashburnham — Brush disposal (54 acres).

Fenno, Westminster — Brush disposal (36 acres) and (80 acres).

Lynde, Westminster — Brush disposal (39 acres).

The total number of trees planted was 89,000, of liberation cutting — 27 acres, of brush disposal — 470 acres, and 109,150 Ribes eliminated.

FOREST SURVEY.

The work of completing an extensive forest type survey of the entire state was further carried on during the past summer. The southern part of Berkshire County was covered, and next year, it is our intention to finish the northern part of this county. This work is done during vacation season by students from forestry schools.

By the use of these type plans and data gathered from first-hand knowledge of the conditions existing throughout our forest areas, this department is better able to handle the forestry problem of Massachusetts.

<i>Examinations.</i>			
Subject	Number	Acres	
Thinning	12	1,060	
Insects and disease	14	230	
Planting	9	4,825	
Thinning and planting	8	1,122	
Estimating and operating	11	919	
Totals	54	8,156	

The examinations of privately owned woodlands as well as shade trees number 54.

The public is becoming thoroughly alive to the value and beauty of trees. Consequently, the examinations dealing with thinnings and insects and disease are increasing. The public is also taking great interest in the beautifying of home grounds, whether they are large or small so that examinations dealing with the ornamental side of forestry are inclined to exceed those dealing with the commercial.

NURSERIES.

Although nursery production has been increased, the demand for planting stock from private planters, state institutions, and towns operating town forests still exceeds the output. The demand for stock for private reforestation work is particularly strong. Last spring we were able to supply everyone who applied for stock, but only by cutting our own program. Another factor which permitted us to supply all applicants was the difficulty experienced by some who had ordered stock early, to secure help for planting. This condition resulted in cancellations of orders amounting to over 100,000 trees.

At the present time we have in our three main nurseries and six reservation nurseries approximately 20,000,000 trees. We still have too few of some species and too many of others, but adjustments are constantly being made. About 7,000,000 of our total stock are transplants. There is more white pine seed obtainable now than for several years past, but it is still almost impossible to secure red pine seed in large quantities.

The following table shows the distribution of stock shipped from our three main nurseries during the spring of 1923.

Sold	1,123,575
Reforestation lots	69,000
State Forests	70,600
State Institutions	135,950
Town Forests	101,300
	1,500,425

Reference is made to the above in another section of this report.

In addition, there were shipped from the main nurseries about 2,000,000 seedlings which are transplanted in the reservation nurseries, and which are intended for exclusive use on state reservation planting.

The only new feature is the construction of another small display nursery on the Mokawk Trail. Ground has already been broken and the grading has been practically finished. This nursery will be complete as to detail but will contain only about 75,000 transplants. It is intended mainly as an educational project and for this purpose the site is ideal, but there are several sizable areas in the vicinity where planting may be done, so all trees produced in the nursery will be used to the best advantage.

The other small display nursery located at Erving has proven very successful from all standpoints. Several hundred people visited this nursery last year and there is no doubt that the increased interest in reforestation work was in many cases awakened as the result of such visits.

STATE FORESTS.

Since the last annual report 11,000 acres have been added to the area of the state forests 3,700 acres of which are divided among three new forests, while the balance represents additions to existing forests.

As in previous years, first importance has been given to the opening up and reconstruction of old abandoned town and logging roads and the opening of new ones in order that the forests may be accessible for fire fighting, general administration purposes and for those of the general public who wish to make use of them for recreational purposes.

Private land owners made such heavy demands on our nurseries through the purchase of stock that comparatively few trees were left for spring planting on state forests. In order, however, that we should not get too far behind in our planting program, we tried the experiment of fall planting on several of our forests. We have attempted fall planting in a small way in previous years and often have had excellent success.

The year was a dry one with a large deficiency of rainfall. In spite of the fact, the forest fire conditions in the state as a whole were much better than we had a right to expect. The State forests, however, were badly hit, four of them suffering from fire, two, Myles Standish and Shawme, severely.

The work on these forests has been greatly facilitated by the addition of three Ford trucks, one at October Mountain, one at Savoy and one at Otter River. With two trucks at Myles Standish we have a fleet of five for use in State forest administration. These trucks are not only used on the forests on which they are stationed but serve other forests in the neighborhood.

Savoy Mountain Forest.

The roads were maintained by cutting the roadside brush on about 18 miles and 8 miles were repaired by ditching, clearing culverts and filling gullies. Thirteen thousand four-year spruce were set in the field near the Burnett house and the Lewis Hill nursery was enlarged by transplanting therein 350,000 two year spruce.

Mohawk Trail.

Seven stone fire places were made at the camp sites between the highway and Cold River. These camp sites were in constant use all summer, as many as 46 auto parties occupying them at one time and it required nearly all the time of one man to clean up after the automobilists who frequented these camp sites and other spots along the Trail. On Labor Day 6,000 autos passed over the Trail in both directions. Ground has been broken for a small demonstration nursery to be located near the Totem Trading Post.

Wendell Forest.

Six miles of wood road were cleared of brush and the brush burned, 42,000 four year white pine transplants set in old mowings and pastures in the southeast part of the forest. The New England Power Co. has constructed a transmission line 250 feet wide across this forest during the past year.

Erving Forest.

Four miles of roads formerly cleared have been brushed again and one mile of new road built running from the State Highway towards Laurel Lake. 130,000 two year seedlings were transplanted into the nursery on the state road and a tool house and portable camp for the nursery caretaker erected. Five thousand four year transplants were set out on the forest.

Mt. Grace.

During the past winter we cut 270 cords of chestnut and pine logs on this forest which were sold to the New England Box Company. We should have cut more but the very deep snow prevented extensive woodland operations. Ten thousand four year larch were planted in the Manning pasture, the west trail to the Northfield road cleared and a new east trail to the Winchester road built. Underbrush along the Northfield road was cleared on a strip 125 feet wide for about one half mile.

Otter River.

Eighty thousand four year old trees, white and Scotch pines were transferred to the field and 400,000 two year old seedlings were transplanted into the nursery. Fire lines along the railroad were cleared of brush and one mile of new fire line

plowed. One mile of wood road was repaired by renewal of rocks and filling of gullies, and the bridge over Otter River repaired in cooperation with the town. A liberation cutting of birch was made in a 15 acre plantation of larch and white pine. During the early fall the crew of this forest collected 40 bu. of red pine cones and minor repairs were made on buildings.

Colrain Forest.

Fifty thousand four year spruces were set out in this forest under contract during the fall, brush cleared on both sides of two miles of road and weevil-infested tips cut and burned in the older pine plantations.

Harold Parker Forest.

Five new fire lines, two on the east side and three on the west side of Salem Street were cut to a width of 40 feet. Several acres of land on which the oak growth was killed by fire or gypsy moths were thinned and 100 cords of wood salvaged which were sold at a good price. Some minor repairs were made in the road on Salem St., although this is a town way and should be maintained by the town of North Andover. Plantations were made by the use of 30,000 larch and 10,000 pine but because of the dryness of the summer they have suffered heavy loss and may have to be filled in.

Swann and Beartown Forests.

The roadside brush on $2\frac{1}{2}$ miles of roads was cut and burned. Twenty-five thousand four year spruce were set in Beartown Forest and 8,000 pine in Swann. The old sheep barn on the Swann estate was sold to a Great Barrington contractor and has been torn down and removed. The standing chestnut was sold to a lumber operator, but after cutting a few dozen poles he became discouraged at the labor situation and gave up the work. The dry weather affected the hay crop so that very little was salable. A crew of seven college boys worked through the summer eradicating currants and gooseberries to prevent the spread of pine blister rust and covered the Swann area (1,000 acres). 75,000 two year spruce were transplanted into the nursery.

October Mountain (Whitney Tract).

On this forest fifteen miles of road were cleared of brush and on $7\frac{1}{2}$ miles brush previously cut was again mowed over. Some repairs on the main road such as clearing ditches and filling ruts were effected. Extensive repairs were made on buildings. The headquarters house was shingled and some old sheds adjacent to the French and Huban places were torn down. A stable was built inside the big hay barn and the former horse barn transformed to a garage. A telephone line was extended to the Clark House. One hundred and fifty acres were mowed over partly to salvage the grass and partly for fire protection. One hundred and fifty thousand four year old spruce were planted in the pastures between the headquarters house and the Whitney mansion and 400,000 two year seedlings were transplanted into the nursery.

October Mountain (Schermerhorn Tract).

On this section of the forest $7\frac{1}{2}$ miles of old roads were brush-cleared and 6 miles of new road cut. A cesspool was constructed for the Felton house and other minor repairs made. All the chestnut on this tract estimated at 600-700M ft. was sold to a local operator who has already commenced logging.

Granville-Tolland Forest.

The hay around Coe and McGrannis houses was mowed for fire protection and other mowings where grass was too poor to sell were burned over. The Coe house has been rented to a lumber operator. Blister rust work was completed on the Granville section by removal of ribs on the portion not covered last year. Twenty-five thousand spruce were set in Granville section. Repair work was done on the telephone lines to the McGrannis house and the fire tower. The town road from E. Otis to the Curtin Cabin (Tolland section) had to undergo considerable repairs in places to make it passable by motor.

Myles Standish Forest.

The sprout growth at the side of some ten miles of roads has been removed and a new form of fire line constructed on the College Pond road (east) and Halfway Pond road (east) about eight miles in length. On either side of these roads a strip 12 feet wide has been plowed about 12' back from the roadway which being about 10' wide makes a fire line 50' to 60' in width and this when completed will divide the forest into quadrants. The new 5 ton tractor was of great assistance in the construction of these lines. That efficient fire lines are greatly needed was made evident when on August 26 a large fire starting off the state forest, burned about 500 acres of our land together with 1,500 acres of land outside. Fortunately the burned area had not been reforested and so no serious damage was done. Our fire fighting equipment on this forest has been increased by the addition of a Howe-Ford pump, a loan from the Federal Government from its war time equipment.

Less planting was accomplished than for several seasons past, but 104,000 three year Austrian pines were set in the area burned over by the fire just mentioned, and 375,000 two year Austrian pines were transplanted to the nursery.

The camp sites on the various ponds have become very popular and over 150 are now leased. The picnic grounds on College Pond are in constant use especially on Sundays and holidays. In this connection it may be said that these campers formed an excellent fire fighting force at the time of the fire of August 26-27. A road has been completed around Fearing Pond in order that all the camp sites on this pond may be accessible.

This forest is a game sanctuary where game is protected and propagated. The superintendent raised 150 pheasants, 50 of which were liberated on the forest. Deer have become too plentiful and they are injuring the young pines in the nursery and plantations.

Shawme Forest.

A great fire in Sandwich and Bourne which devastated an area of more than 12,000 acres burned over the whole of this forest in May. Fortunately very little development work had been done on this forest and the growth was mostly scrub oak so that the loss to the Commonwealth was largely confined to about 40 acres of young plantation. It is realized that nothing can be done to this forest until it is given adequate fire protection. A crew of men is now at work clearing out roads and constructing fire lines. In order to house this crew a substantial camp capable of containing a dozen men was built at the north end near the state highway.

AREA OF THE STATE FORESTS, NOVEMBER 30, 1923.

Name of Forest	Acreage
Arthur Warton Swann	986.75
Beartown	6,452.1
Colrain	1,126.694
Conway	1,141.18
Erving	3,491.9
Harold Parker	1,327.6
Hawley	850.
Leominster	525.47
Mohawk Trail	5,026.5
Mount Grace	1,065.825
Myles Standish	7,757.
Oakham	313.
October Mountain	12,111.3
Otis	885.
Otter River	1,760.75
Pittsfield	884.64
Sandisfield	1,319.5
Shawme	1,338.36
Savoy Mountain	5,809.4
Tolland-Granville	3,377.

Name of Forest	P.D. 73. Acreage
Wendell	3,503.32
Worthington	225.
Unassigned land	2,313.8
Total	63,592.289

REPORT OF THE STATE FIRE WARDEN.

Mr. WM. A. L. BAZELEY, *State Forester*.

SIR:—In compliance with the provisions of section 28, chapter 48 of the General Laws, I submit herewith a report of the work accomplished by this branch of the division during the year just ended.

The season of 1923 was a comparatively favorable one from the standpoint of forest fire protection, although a large number of fires occurred during the spring months before vegetation was sufficiently advanced to prevent them.

While our reports show that fires occurred frequently during the entire season, the vigilance and energy of our organization was such as to enable us to extinguish them in their incipient stage except in a very few instances. Our fire season began in the early part of March, and from that time until the first of June, there was very little rainfall. During this period we had two serious forest fires, the first occurring in Douglas and burning over 9,000 acres of so-called cut-over lands. The story of this fire affords a striking example of the result of insufficient care in extinguishing fires. Originally a small fire had started and was supposed to have been extinguished. The next day, however, with a high wind blowing, it broke out again with the disastrous result noted above. The second fire was in the towns of Bourne and Sandwich and burned over 17,000 acres of land well covered with pitch pine and scrub oak. I am convinced that the large acreage burned over by this fire was absolutely due to improper methods such as the setting of back fires by the local organizations. Unfortunately many of the residents of the Cape do not place sufficient value on their forested areas and consequently are not concerned about fires until their buildings are in danger. During the season forty-six buildings were destroyed as a result of forest fires. A garage, barn and contents were burned in Canton; in Weston, a house and barn; Tyngsborough, a summer camp and garage, while Billerica suffered the loss of eight summer cottages.

On October 10 we were called on to assist in the extinguishment of an extensive peat bog fire in the town of Norwood. This fire had been burning seven weeks and the smoke had become so dense that there were times even during the day when it was practically impossible to operate with safety automobiles, street cars or even railroads in that section of the state. Not having proper equipment to cope with a fire of this nature, an appeal was made to the Governor and Council and they immediately responded with an appropriation of \$3,000. With this appropriation was purchased one Fairbanks & Morse and two Great Northern pumps and 2,000 feet of hose. With this apparatus, supplemented by two of our own pumps, after three weeks of steady work the fire was extinguished.

Owing to the long continued drouth immediately prior to the opening of the hunting season, Lieut. Gov. Fuller, Acting Governor, issued a proclamation suspending the season until a sufficient amount of rain had fallen as to eliminate danger from fire. Fortunately for the sportsmen of the Commonwealth, the season was closed only one day as heavy rains relieved the situation.

I wish to express my grateful appreciation of the valuable aid rendered by the State Constabulary, not only in assisting in the work of extinguishing fires but in the enforcement of the fire permit and slash law. Inasmuch as this patrol force is to be increased in the near future with additional stations and motorized apparatus, I look forward with pleasureable anticipation to still greater aid from this valuable branch of the public service.

A new fifty-eight foot steel tower was erected at the summit of Mount Toby in the town of Sunderland on lands owned by the Commonwealth and used as a demonstration forest by the Amherst Agricultural College. This tower was purchased by the college and erected by this department. Four miles of telephone wire was installed to connect this tower with the New England Telephone lines.

The thirty-eight foot tower that has been in use on Berlin Mountain in the town of Williamstown for the past six years was removed four miles farther south to Mount Brodie in the town of Hancock where we will be able to protect a much greater area of Massachusetts forest lands. It was necessary to erect six miles of telephone line to the town from this tower.

A new telephone line has been installed at the Falmouth observation station and several of our towers in the eastern part of the state have been repainted.

Transmission power companies have cut several miles of new lines through the state and brush from their cuttings is now being burned. These rights of way will make excellent fire lines when completed.

The law requiring operators of portable saw mills and other persons engaged in lumbering operations to file with this office a statement giving the location of such operations has met with the general approval of all operators and 140 reports were filed. This information proved to be of great value inasmuch as it enabled our district men to visit the scene of operation and render advice with respect to the disposition of slash at a very minimum expense to the Commonwealth.

The permit law has been generally enforced by the town forest wardens. It was necessary, however, to discontinue the issuance of them throughout the eastern part of the state at different times during the long drouths but this was generally approved by the public. Forty-two thousand permits were issued throughout the state. Fifteen parties were fined and sixty-seven paid the cost of extinguishment for violating the permit law.

During the month of February forest fire conferences were held at Middleborough, Boston, Worcester, Springfield and Pittsfield. These meetings were well attended by forest wardens, selectmen, patrolmen from the state constabulary and railroad employees. At the Springfield and Pittsfield meetings representatives from the forestry departments of Connecticut and New York were in attendance. The discussions which took place at these meetings covering a great variety of topics bearing on the forest fire problem were of great value.

Another important conference was the one held at the State House on February 20. This conference was made up of representatives from all the New England states and New York, and by special invitation Mr. Claude Leavitt was present representing the Canadian Government. There were also present several officials from the Federal Forest Service. Several important topics were discussed including standardizing forest fire damages, interstate co-operation, fire plan maps, educational publicity, slash disposal, Federal co-operation and methods of handling co-operative accounts. This meeting was adjourned to the next day when it was joined by representatives of the New York, New Haven & Hartford, Boston & Albany, Boston & Maine, Central Vermont, Grand Trunk, Bangor & Arcostook, New York Central, Delaware & Hudson, and Long Island railroads. This conference was largely devoted to a discussion of those questions which have a direct bearing on fires caused by railroads.

For several years we have endeavored to impress upon the railroads the benefit which would accrue if they should take advantage of the law to enter upon property adjoining their rights of way with the consent of the owner and dispose of leaves, brush and other inflammable material. It was not until this spring, however, that any attempt was made along this line. Following a very careful survey made this spring by railroad officials in company with representatives of this department, extensive work was done along this line. The reports which we have received from the railroads indicate that a very great reduction in the annual fire damages paid by the several companies resulted from this cleanup.

Co-operative work between this department and the Federal Government has been continued. Mr. C. R. Tillotson of the Forest Service spent two weeks during the past season traveling about the state accompanied by our district men, and expressed himself much pleased with the systematic working of our prevention system.

The amount received from the Federal Government under the Weeks Law Fund was \$10,752.26.

Respectfully submitted,

M. C. HUTCHINS, *State Fire Warden.*

COMPARATIVE DAMAGES BY FOREST FIRES FOR THE PAST THREE YEARS.

YEAR.	Number of Fires.	Acreage burned.	Cost to extinguish.	Damage.	Average Acreage per Fire.	Average Damage per Fire.
1921 . .	2,849	29,221	\$34,065	\$121,790	10.25	\$42 75
1922 . .	4,099	85,241	101,714	501,648	20.79	122 38
1923 . .	2,672	48,602	51,448	161,043	18.18	60 27

TYPES OF CLASSIFIED DAMAGES.

	1922.	1923.
Standing trees	\$285,754 00	\$83,019 00
Logs, lumber, cordwood	79,935 00	43,244 00
Buildings	63,308 00	16,317 00
Bridges, fences	6,918 00	397 00
Sproutland	58,326 00	17,761 00
Miscellaneous	7,407 00	305 00
Totals	\$501,648 00	\$161,043 00

TYPES OF LAND BURNED OVER (ACRES).

	1922.	1923.
Timber	7,828	1,235
Second growth	16,508	6,970
Second growth, not merchantable	20,214	17,124
Brush land	29,163	19,802
Grass land	11,528	3,471
Totals	85,241	48,602

FOREST FIRES OF 1923.

MONTHS.	Number.	Acres.	Cost to extinguish.	Damage.
1922.				
December	36	241	\$325 00	\$575 00
1923.				
January	3	54	8 00	25 00
February	6	2	14 00	17 00
March	207	754	1,224 00	603 00
April	1,088	8,671	12,638 00	45,237 00
May	486	34,163	19,016 00	95,382 00
June	109	507	2,087 00	4,086 00
July	81	130	830 00	889 00
August	129	1,389	4,657 00	5,392 00
September	109	634	2,237 00	2,663 00
October	288	1,659	7,606 00	5,437 00
November	130	398	806 00	737 00
Totals	2,672	48,602	\$51,448 00	\$161,043 00

CLASSIFIED CAUSES OF FOREST FIRES, 1921-1923.

	1921.		1922.		1923.	
	Number.	Percent.	Number.	Percent.	Number.	Percent.
Railroad	862	30.25	1,511	36.86	1,006	37.65
Lumbering	4	.14	4	.09	4	.15
Brush burning	327	11.48	545	13.99	241	9.02
Campers	12	.42	30	.07	49	1.84
Incendiary	52	1.83	131	3.19	58	2.17
Miscellaneous	537	18.85	952	23.21	750	28.07
Unknown	1,055	37.03	926	22.59	564	21.10
Totals	2,849	100.00	4,099	100.00	2,672	100.00

RAILROAD FIRES OF 1923.

RAILROAD.	Mileage.	Number of Locomotives.	Number of Fires.	Acreage burned.	Cost to extinguish.	Damage.
New York, New Haven & Hartford	1,883	922	719	5,551	\$5,790	\$16,817
Boston & Albany	979	354	92	560	844	1,079
Boston & Maine	2,017	1,025	187	766	2,243	7,604
Central Vermont	71	23	8	79	127	172
Totals	4,950	2,324	1,006	6,956	\$9,004	\$25,672

REPORT OF THE SUPERINTENDENT OF MOTH WORK.

Mr. WM. A. L. BAZELEY, *State Forester.*

SIR: — Following the practice of previous years, I am pleased to submit for your information a report of progress made in the work of suppressing the gypsy and brown-tail moths during the fiscal year ending November 30, 1923. Work was vigorously prosecuted along the general lines found to be desirable and effective in the past. The continued cheerful co-operation of the city and town authorities has been exceedingly helpful and indicates on their part a just appreciation of the importance of protecting the forest, shade and orchard trees in the Commonwealth from the ravages of these insects.

General Conditions.

It is with satisfaction that I am able to report general conditions less severe than in former years. It is true, as stated in our report for the year 1922, that gypsy moth infestations have now been found in nearly every city and town in the Commonwealth. Careful scouting operations that have been carried on in the western part of the state show that the infestations in nearly all of the towns west of the Connecticut River are slight and can be easily controlled. I cannot urge too strongly the importance of fall scouting operations when this work can be done more efficiently and at a much less expense than after the snow has fallen.

In the gypsy moth infested areas in the eastern part of the state where gypsy moth work has been carried on for many years, I am pleased to state that very little defoliation was noted. This improved condition was especially noticeable in the so-called Cape district where in previous years widespread defoliation prevailed. During the past season defoliation was noted in only three or four towns. A few instances of defoliation were also found in the northern part of the state and these areas will be given special attention during the coming season. Credit for this improved condition should be given to the earnest and increased efforts of the local authorities in the several towns in combating the insect.

In most of the cities and towns scattering webs of the brown-tail moths were found and destroyed. Because of the extreme vigilance used to discover and destroy the webs of this insect we are confident that the coming season this insect will be reduced to a negligible quantity.

I desire to take this opportunity to acknowledge the thorough work done under the direction of Professor W. C. O'Kane, State Entomologist of New Hampshire,

in removing the brown-tail webs in the southern New Hampshire towns bordering on the Massachusetts line. As a result of this work the Massachusetts border towns show a marked decrease in the number of webs of this insect.

State Highway Work.

As in former years the protection of the shade trees bordering the state highways from the ravages of injurious insects was performed under the direction of this department. The egg clusters of the gypsy moth were creosoted; brown-tail moth webs were removed and destroyed and the trees carefully sprayed. As usual, the work was performed by the local organizations or by the traveling sprayers owned by the state, our division superintendents having immediate charge of the work.

Special North Shore Work.

In previous reports we have referred to the extensive operations that have been carried on to protect the beautiful woodlands along the North Shore. This work was begun in 1908 and was made possible because of the foresight and activity of Colonel William D. Sohier who organized a committee of wealthy summer residents of that section, and from the inception of the work to the present time they have earnestly co-operated with this department. During the year just ended rough creosoting work was done along thirty miles or more of wood drives and in approximately 3,600 acres of woodland. The creosoting work was followed by spraying operations with excellent results. At no time since the war began have conditions been more encouraging.

Respectfully submitted,

GEORGE A. SMITH, *Superintendent of Moth Work.*

FEDERAL GYPSY MOTH WORK IN MASSACHUSETTS.

BY A. F. BURGESS.

The field work of the Bureau of Entomology has been carried on during the past year principally in Berkshire County. In the spring of 1923, scouting was carried on and later the infestations discovered were thoroughly sprayed. The territory that has been covered during the fall indicates that the infestations were not quite as serious as those that were found the previous year. The spring of 1923 was very favorable for spraying work and excellent results were secured.

In the fall the storehouse of the Bureau was moved from Franklin, New Hampshire to Pittsfield, Mass., and the buildings selected there will be used for the storage, repair and distribution of field supplies for the western part of the New England area.

The inspection of nursery, forest and quarry products has been continued under the regulations prescribed by the Federal Horticultural Board. The requirements relative to shipment of nursery stock have been made more stringent during the past year owing to the fact that a few egg clusters of the gypsy moth escaped the attention of the inspectors and were shipped to outside territory. A special effort is being made to require all nurseries to keep their grounds and premises free of the gypsy moth infestation, and the condition of stock offered for shipment in the fall of 1923 was more satisfactory in this respect than heretofore.

The gypsy moth laboratory has been maintained at Melrose Highlands and has conducted a number of lines of important research work. Parasites have been colonized in sections of the state where it has been impossible to liberate them earlier on account of lack of material. Foreign investigations were carried on during the spring and summer by Dr. J. N. Summers in Japan, and in Europe by Mr. S. S. Crossman and Mr. R. T. Webber. Gypsy moth infestations were very scarce in Japan, which made it difficult to secure parasites for shipment. Surveys were made in Spain, France, Italy, Germany, Poland, Austria and Hungary during the year. In the regions visited gypsy moth infestation was slight except in Spain and Hungary. From the latter country it was possible to secure several large shipments of Tachinid parasites. These arrived in Melrose in good condition and are now in hibernation. Whether the species concerned will come through the winter satisfactorily cannot be determined until next summer. It seems probable

however, that at least one of the species will make a very valuable addition to the imported enemies of the gypsy moth.

Sample collections made from different sections of the state during the year indicate that the parasitism of the gypsy moth averages higher than at any time heretofore. In the region that has been longest infested the density of infestation has decreased rapidly, and these useful enemies of the gypsy moth have played an important part in supplementing the field work that has been done in the towns throughout the state.

The brown-tail moth has not been seriously abundant except in limited areas, although the number of winter webs reported from some of the towns show a considerable increase over the previous year. The sample collections made of this insect from different localities indicate a high mortality due to the work of the imported parasites.

APPENDIX.

FINANCIAL STATEMENT.

Receipts and Expenditures for Year ending November 30, 1923.

PURPOSE OF APPROPRIATION.	Amount.	Refunds and Balances.	Expendi- tures.	Balance to 1924.	Balance to Treasury.
Salary of Commissioner	\$5,500	-	\$5,500 00	-	-
Personal Services	10,600	-	10,198 09	-	\$401 91
Expenses of Commissioner	250	-	229 82	-	20 18
Office Incidentals	6,700	\$7 70	4,771 80	-	1,935 90
General Forestry and Nurseries	13,500	-	9,574 85	-	3,925 15
Purchase and Planting of Forest Lands	10,000	984 67	6,666 33	-	4,318 34
Prevention of Forest Fires	48,000	10,752 26	58,750 04	-	2 22
Protection against Forest Fires	2,000	-	1,978 98	-	21 02
Reimbursement for Fighting Fires	1,000	-	134 95	-	865 05
Suppression of Gypsy and Brown Tail Moths	130,000	89,548 69	174,987 22	\$44,561 47	-
Maintenance of Forests	25,000	-	24,903 07	-	96 93
Purchase and Development of State Forests	150,000	103,344 74	147,606 61	105,738 13	-
Maintenance of Mount Grace	1,000	-	947 38	-	52 62
Maintenance of Standish Monument	1,500	-	1,490 43	-	9 57
Repair of Myles Standish Statue	2,000	-	100 00	1,900 00	-
Special Appropriation for Norwood Fire	3,000	-	2,996 21	-	3 79
	\$410,050	\$204,638 06	\$450,835 78	\$152,199 60	\$11,652 68

Receipts.

For lumber sold	\$7,116 93
For cord wood sold	686 00
For sale and rent of buildings	645 00
For hay and other products	203 00
For right of way over land	1,000 00
For rent of camp sites	872 00
For miscellaneous	6 70
For examinations	135 70
For trees	8,495 90
For redemption of lots	3,893 78
For sale of books and cards	28 10
For sale of products from reforestation lots	1,022 41
For damages	188 00
For supplies for gypsy moth work	15,219 35
For donations to North Shore Fund	2,000 00
For private work on North Shore	697 80
For highway work	2,783 45
For supplies for fire fighting	2,712 04
Total for year	\$47,706 16

STATEMENT OF EXPENDITURES AND RECEIPTS ON STATE FOREST FOR THE YEAR
ENDING, NOVEMBER 30, 1923.

STATE FOREST.	Planting and Nursery.	General Upkeep, Fire Lines and Roads.	Surveying, Titles, etc.	Land.	Total.	Receipts.
Arthur Warton Swann	\$821 26	\$2,610 13	\$12 00	—	\$3,443 39	\$659 50
Bear Mountain	230 38	37 00	1,729 69	\$5,225 00	7,222 07	50 00
Colrain	800 00	450 00	32 25	2,650 00	3,932 25	—
Conway	—	10 00	822 54	2,350 00	3,182 54	35 00
Erving	730 07	1,242 58	1,096 76	6,618 25	9,687 66	25 00
Harold Parker	280 88	2,637 02	1,378 13	1,317 00	5,613 03	536 00
Hawley	—	—	—	3,737 50	3,737 50	—
Leominster	—	—	829 28	1,836 50	2,665 78	—
Mohawk Trail	233 71	1,307 69	864 29	2,571 50	4,977 19	—
Mount Grace	91 00	925 50	—	—	1,016 50	1,360 43
Myles Standish	2,261 47	6,272 99	452 36	—	8,986 82	929 70
Oakham	68 25	—	2 78	440 00	511 03	—
October Mountain	2,466 92	9,415 09	3,040 82	4,660 00	19,582 83	5,667 00
Otis	—	—	—	3,292 50	3,292 50	—
Otter River	1,994 29	2,547 55	—	—	4,541 84	124 00
Pittsfield	—	—	442 83	—	442 83	—
Sandisfield	—	—	253 15	4,250 00	4,503 15	8 00
Savoy Mountain	2,107 43	2,001 14	729 14	1,806 50	6,644 21	40 00
Shawnee	—	648 19	2,375 85	319 80	3,343 84	—
Tolland-Granville	765 17	3,422 82	1 02	888 00	5,077 01	95 00
Wendell	617 10	337 50	1,505 11	2,681 50	5,141 21	500 00
Worthington	—	—	89 44	1,500 00	1,589 44	—
Unassigned land	—	—	—	9,699 87	9,699 87	—
	\$13,467 93	\$33,865 20	\$15,657 44	\$55,843 92	\$118,834 49	\$10,029 63

THE DISTRIBUTION OF SUPPLIES.

Supplies have been furnished to towns and cities for gypsy moth work as usual. The amounts given below do not correspond with the amount of aid given to the municipalities, as some towns make payment to the State for all or a part of the bill for supplies, according to the amount of their net expenditure and their class, under the provisions of section 4, chapter 132 of the General Laws.

For amounts received from this office in reimbursement and for expenditures, see table on page 23.

LIST OF TOWNS AND AMOUNTS OF SUPPLIES FURNISHED FOR 1923.

Acton	\$795 19	Essex	\$316 91
Ashburnham	374 29	Foxborough	959 46
Ashby	828 59	Freetown	363 62
Ashland	542 43	Georgetown	1,051 88
Avon	257 80	Groton	878 38
Bedford	2,274 51	Groveland	378 58
Berkley	332 39	Halifax	597 32
Berlin	488 75	Hanover	2,217 69
Bolton	835 29	Hanson	656 05
Boxborough	715 40	Harvard	1,465 20
Boxford	1,085 29	Harwich	1,054 69
Boylston	408 25	Holbrook	366 69
Brewster	541 04	Holden	489 15
Bridgewater	904 53	Holliston	487 75
Burlington	754 37	Hopkinton	452 02
Carlisle	928 32	Hubbardston	2 40
Carver	1,605 38	Kingston	438 26
Chatham	49 75	Lakeville	997 62
Dennis	592 90	Lincoln	1,613 69
Dover	1,460 51	Littleton	1,537 66
Dracut	2,433 90	Lunenburg	2,007 72
Dunstable	370 48	Lynnfield	644 86
Duxbury	1,203 52	Marion	1,446 31
East Bridgewater	1,374 10	Marshfield	2,970 11
Eastham	338 52	Mashpee	434 35
Easton	1,513 90	Medfield	911 66

P.D. 73.			23
Merrimac	\$306 64	Stow	\$1,194 53
Middleton	527 89	Sudbury	2,353 46
Newbury	1,281 95	Templeton	88 89
Norfolk	293 05	Tewksbury	1,354 87
North Reading	2,133 35	Tisbury	532 74
Northborough	1,857 44	Topsfield	471 08
Norton	401 80	Townsend	336 33
Norwell	915 25	Truro	212 97
Oakham	2 20	Tyngsborough	1,055 36
Orleans	606 93	Wayland	1,067 17
Pembroke	1,252 68	Wellfleet	326 59
Pepperell	758 57	Wenham	415 35
Plainville	352 87	West Boylston	486 13
Plympton	251 21	West Bridgewater	2,042 41
Princeton	390 73	West Newbury	651 89
Raynham	446 55	Westborough	600 46
Rochester	521 55	Westford	1,482 79
Rowley	738 67	Westminster	393 46
Salisbury	884 74	Weston	811 33
Sandwich	1,226 76	Wilmington	1,776 75
Sherborn	899 25	Winchendon	6 69
Shirley	653 29	Yarmouth	776 53
Southborough	1,739 57		
Sterling	621 42		\$83,187 50

Automobile supplies	\$1,073 15
General Forestry and Nurseries	159 62
Maintenance of Forests	196 47
Special North Shore Fund	3 20
Prevention of Forest Fires	747 85
Purchase and Development of State Forests	141 67
Purchase and Planting of Forest Lands	5 36
Shop Equipment	4 07
Travelling Sprayers and Highways	1,317 06
	\$3,648 45

TABLE SHOWING EXPENDITURES AND REIMBURSEMENTS OF TOWNS AND CITIES
FOR THE YEAR 1923.

CITIES AND TOWNS.	1923.						1924.
	Required Expenditures.	Total Net Expenditures.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditures.
Abington	\$1,775 73	-	-	-	-	-	\$2,325 08
Acton	991 67	-	-	-	-	-	1,088 65
Acushnet	1,269 91	\$1,125 73	\$72 75	\$134 06	\$795 19	\$929 25	1,417 76
Adams	4,395 33	-	-	-	-	-	6,802 69
Agawam	2,405 67	-	-	-	-	-	2,363 96
Alford	87 32	-	-	-	-	-	110 60
Amesbury	4,186 33	-	-	-	-	-	4,729 57
Amherst	2,992 98	-	-	-	-	-	3,256 24
Andover	4,787 33	-	-	-	-	-	5,000 00
Arlington	5,000 00	-	-	-	-	-	5,000 00
Ashburnham	593 89	942 61	110 15	348 72	374 29	723 01	722 80
Ashby	376 03	445 24	Ld. 492 20	69 21	828 59	897 80	497 26
Ashfield	426 49	101 00	-	-	-	-	458 71
Ashland	805 09	1,258 22	53 75	453 13	542 43	995 56	939 80
Athol	3,813 74	-	-	-	-	-	4,762 04
Attleboro	5,000 00	-	-	-	-	-	5,000 00
Auburn	1,243 43	195 70	86 75	-	-	-	1,137 48
Avon	605 28	605 21	72 85	-	257 80	257 73	617 94
Ayer	1,256 77	-	-	-	-	-	1,347 47
Barnstable	4,414 44	-	-	-	-	-	4,409 96

CITIES AND TOWNS.	1923.						1924.
	Required Expenditures.	Total Net Expenditures.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditures.
Barre	\$1,286 72	-	-	-	-	-	\$1,652 06
Becket	330 34	-	-	-	-	-	415 93
Bedford	1,025 29	\$1,394 52	Ld \$1,015 95 78 40	\$369 23	\$2,274 51	\$2,643 74	1,033 98
Belchertown	485 44	-	-	-	-	-	533 00
Bellingham	723 46	-	-	-	-	-	703 56
Belmont	5,000 00	-	-	-	-	-	5,000 00
Berkley	291 97	323 94	75 00	31 97	332 39	364 36	302 91
Berlin	360 76	392 79	149 14	-	488 75	488 75	374 13
Bernardston	261 49	79 21	-	-	-	-	320 18
Beverly	5,000 00	-	-	-	-	-	5,000 00
Billerica	2,857 14	-	-	-	-	-	3,258 25
Blackstone	917 10	-	-	-	-	-	909 32
Blandford	389 12	30 00	-	-	-	-	404 68
Bolton	380 47	388 51	Ld. 20 00 306 01	-	835 29	835 29	412 60
Boston	5,000 00	-	-	-	-	-	5,000 00
Bourne	2,688 67	-	-	-	-	-	2,660 78
Boxborough	139 36	67 85	Ld. 27 00 359 96	-	715 40	643 89	145 16
Boxford	412 38	346 81	178 73	-	1,085 29	1,019 72	461 11
Boylston	275 32	201 75	403 12	-	408 25	334 68	292 15
Braintree	5,000 00	-	-	-	-	-	5,000 00
Brewster	449 72	942 55	475 95 Ld. 30 68	492 83	541 04	1,033 87	478 20
Bridgewater	1,965 35	1,087 15	1,952 25	21 80	904 53	926 33	2,331 21
Brimfield	404 07	-	-	-	-	-	459 91
Brockton	5,000 00	-	-	-	-	-	5,000 00
Brookfield	443 62	437 18	82 90	-	-	-	521 70
Brookline	5,000 00	-	-	-	-	-	5,000 00
Buckland	956 28	-	-	-	-	-	1,078 41
Burlington	608 36	395 25	277 66	-	754 37	541 26	614 51
Cambridge	5,000 00	-	-	-	-	-	5,000 00
Canton	2,586 14	-	-	-	-	-	3,288 10
Carlisle	237 11	654 24	Ld. 213 12 251 83	417 13	928 32	1,345 45	253 49
Carver	973 18	1,148 84	Ld. 89 70 717 28	177 66	1,605 38	1,783 04	935 98
Charlemont	317 99	109 00	-	-	-	-	374 68
Charlton	657 50	-	-	-	-	-	826 29
Chatham	1,337 98	-	-	-	49 75	-	1,350 40
Chelmsford	2,684 74	-	-	-	-	-	2,457 90
Chelsea	5,000 00	-	-	-	-	-	5,000 00
Cheshire	388 68	-	-	-	-	-	509 13
Chester	412 03	-	-	-	-	-	508 08
Chesterfield	173 32	425 71	16 37	252 39	-	252 39	195 48
Chicopee	5,000 00	-	-	-	-	-	5,000 00
Chilmark	187 90	-	-	-	-	-	192 34
Clarksburg	246 13	-	-	-	-	-	361 75
Clinton	5,000 00	-	-	-	-	-	5,000 00
Cohasset	2,786 12	-	-	-	-	-	2,903 15
Colrain	547 11	-	-	-	-	-	710 74
Concord	3,012 99	-	-	-	-	-	3,239 50
Conway	376 17	229 06	36 50	-	-	-	437 26
Cummington	161 83	-	-	-	-	-	194 10
Dalton	2,132 02	-	-	-	-	-	2,381 29
Dana	274 17	207 42	59 11	-	-	-	264 59
Danvers	3,739 39	-	-	-	-	-	4,056 57
Dartmouth	3,456 69	-	-	-	-	-	3,465 13
Dedham	5,000 00	-	-	-	-	-	5,000 00
Deerfield	1,841 44	-	-	-	-	-	1,945 26
Dennis	656 68	661 58	Ld. 93 60 407 46	-	592 90	592 90	712 60
Dighton	1,300 53	-	-	-	-	-	1,435 43
Douglas	623 24	-	-	-	-	-	852 51
Dover	1,188 66	1,143 04	Ld. 259 48 455 67	-	1,460 51	1,414 89	1,367 51
Dracut	1,356 10	2,182 19	641 58	826 09	2,433 90	3,259 99	1,539 22
Dudley	1,353 18	-	-	-	-	-	1,728 31
Dunstable	180 56	373 33	Ld. 34 32 268 95	192 77	370 48	563 25	280 85
Duxbury	1,786 31	2,209 73	Ld. 13 00 870 69	423 42	1,202 45	1,625 87	1,767 68
E. Bridgewater	1,522 65	1,394 67	1,005 20	-	1,374 10	1,246 12	1,891 67
E. Brookfield	334 59	-	-	-	-	-	364 50
E. Longmeadow	870 96	-	-	-	-	-	891 40
Eastham	280 57	639 37	168 00	358 80	338 52	697 32	281 24
Easthampton	5,000 00	-	-	-	-	-	5,000 00

CITIES AND TOWNS.	1923.						1924.
	Required Expendi- tures.	Total Net Expendi- tures.	Private Work.	Reimburse- ment.	Tools supplied.	Total Amount received from State.	Required Expendi- tures.
Easton	\$1,887 70	\$1,853 74 {	Ld. \$6 30 723 40 }	-	\$1,513 90	\$1,479 94	\$2,395 90
Edgartown	810 57	-	-	-	-	-	793 36
Egremont	278 65	-	-	-	-	-	386 10
Enfield	298 04	-	-	-	-	-	337 34
Erving	743 07	-	-	-	-	-	946 93
Essex	564 34	616 60	900 25	\$52 26	316 91	369 17	622 21
Everett	5,000 00	-	-	-	-	-	5,000 00
Fairhaven	3,914 07	-	-	-	-	-	3,683 45
Fall River	5,000 00	-	-	-	-	-	5,000 00
Falmouth	4,603 67	-	-	-	-	-	4,684 60
Fitchburg	5,000 00	-	-	-	-	-	5,000 00
Florida	529 41	-	-	-	-	-	595 13
Foxborough	1,349 27	1,393 50	450 00	-	959 46	959 46	1,515 62
Framingham	5,000 00	-	-	-	-	-	5,000 00
Franklin	2,551 39	-	-	-	-	-	3,037 42
Freetown	554 00	782 52	155 20	198 52	363 62	562 14	648 38
Gardner	5,000 00	-	-	-	-	-	5,000 00
Gay Head	30 51	-	-	-	-	-	28 57
Georgetown	635 02	846 56	638 53	211 54	1,051 88	1,263 42	639 00
Gill	281 85	-	-	-	-	-	321 24
Gloucester	5,000 00	-	-	-	-	-	5,000 00
Goshen	128 27	-	-	-	-	-	144 79
Gosnold	425 57	-	-	-	-	-	421 63
Grafton	1,934 84	968 79	-	-	-	-	2,635 47
Granby	368 64	-	-	-	-	-	466 38
Granville	239 49	203 40	22 30	-	-	-	304 31
Great Barrington	3,372 55	-	-	-	-	-	4,307 32
Greenfield	5,000 00	-	-	-	-	-	5,000 00
Greenwich	226 70	-	-	-	-	-	241 40
Groton	1,320 29	1,432 24 {	Ld. 302 12 989 76 350 90 }	111 95	878 38	990 33	1,441 03
Groveland	668 45	709 16 {	Ld. 93 86 }	40 71	375 58	416 29	685 05
Hadley	1,142 84	-	-	-	-	-	1,272 33
Halifax	397 15	410 23	1,086 97	13 08	597 32	610 40	388 14
Hamilton	1,787 25	-	-	-	-	-	2,007 19
Hampden	196 50	-	-	-	-	-	221 79
Hancock	167 29	-	-	-	-	-	192 99
Hanover	964 43	1,051 53 {	Ld. 44 60 730 91 }	87 10	2,217 69	2,304 79	1,089 89
Hanson	743 23	1,036 62	625 80	293 39	656 05	949 44	905 13
Hardwick	1,329 53	283 53	122 10	-	-	-	1,496 87
Harvard	821 85	797 97 {	Ld. 415 45 137 72 }	-	1,465 20	1,441 32	867 47
Harwich	1,027 06	975 93	1,378 18	-	1,054 69	1,003 56	1,034 01
Hatfield	1,065 33	-	-	-	-	-	1,230 41
Haverhill	5,000 00	-	-	-	-	-	5,000 00
Hawley	108 33	212 50	-	104 17	-	104 17	124 53
Heath	124 74	102 35	67 30	-	-	-	151 25
Hingham	3,780 62	-	-	-	-	-	3,914 81
Hinsdale	333 62	-	-	-	-	-	385 98
Holbrook	1,003 85	1,000 31	351 75	-	366 69	363 15	1,013 63
Holden	1,044 95	1,152 82 {	Ld. 79 56 418 50 }	107 87	489 15	597 02	1,163 84
Holland	73 00	-	-	-	-	-	82 38
Holliston	1,086 16	588 08 {	Ld. 34 15 452 56 }	-	487 75	-	1,162 28
Holyoke	5,000 00	-	-	-	-	-	5,000 00
Hopedale	1,389 14	-	-	-	-	-	3,349 33
Hopkinton	855 39	680 56 {	Ld. 6 62 171 65 }	-	452 02	276 69	903 27
Hubbardston	413 94	375 90	-	-	2 40	-	451 04
Hudson	2,471 86	-	-	-	-	-	2,929 63
Hull	5,000 00	-	-	-	-	-	5,000 00
Huntington	409 59	296 25	-	-	-	-	500 68
Ipswich	2,876 32	-	-	-	-	-	2,871 41
Kingston	828 91	926 70	388 50	97 79	458 26	536 05	869 45
Lakeville	522 27	915 57 {	Ld. 226 30 177 59 }	393 30	997 62	1,390 92	567 38
Lancaster	1,092 34	-	-	-	-	-	1,518 84
Lanesborough	371 82	-	-	-	-	-	407 78
Lawrence	5,000 00	-	-	-	-	-	5,000 00
Lee	1,544 72	-	-	-	-	-	2,311 81
Leicester	1,184 64	12 80	143 10	-	-	-	1,679 19
Lenox	2,834 19	-	-	-	-	-	3,079 43
Leominster	5,000 00	-	-	-	-	-	5,000 00
Leverett	180 33	-	-	-	-	-	225 90

CITIES AND TOWNS.	1923.						1924.
	Required Expenditures.	Total Net Expenditures.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditures.
Lexington	\$4,352 68	-	-	-	-	-	\$1,395 32
Leyden	114 21	\$138 60	\$24 40	\$24 39	-	\$24 39	141 11
Lincoln	878 43	1,771 25	569 00	-	\$1,613 69	1,613 69	927 85
Littleton	685 20	47 02	31 75	-	1,537 66	899 48	690 16
Longmeadow	2,335 47	-	-	-	-	-	2,367 34
Lowell	5,000 00	-	-	-	-	-	5,000 00
Ludlow	3,510 31	-	-	-	-	-	3,747 71
Lunenburg	743 02	183 86	478 47	-	2,007 72	1,448 56	761 84
Lynn	5,000 00	-	Ld. 398 19	-	-	-	5,000 00
Lynnfield	862 81	1,053 97	581 25	191 16	644 86	836 02	869 87
Malden	5,000 00	-	-	-	-	-	5,000 00
Manchester	4,745 87	-	-	-	-	-	5,000 00
Mansfield	2,547 51	-	-	-	-	-	2,837 24
Marblehead	5,000 00	-	-	-	-	-	5,000 00
Marion	1,390 86	1,510 19	590 39	-	1,446 31	1,446 31	1,436 54
Marlborough	5,000 00	-	-	-	-	-	5,000 00
Marshfield	1,375 71	1,379 32	1,498 13	-	2,970 11	2,970 11	1,354 29
Mashpee	229 83	1,611 69	Ld. 62 14	1,381 86	434 35	1,816 21	242 70
Mattapoisett	879 11	-	608 00	-	-	-	947 30
Maynard	2,157 89	-	-	-	-	-	2,527 51
Medfield	890 79	1,124 67	380 93	233 88	911 66	1,145 54	964 20
Medford	5,000 00	-	Ld. 26 00	-	-	-	5,000 00
Medway	1,000 87	-	-	-	-	-	1,101 94
Melrose	5,000 00	-	-	-	-	-	5,000 00
Mendon	365 48	-	-	-	-	-	376 02
Merrimac	735 45	1,146 37	310 06	410 92	306 64	717 56	800 97
Methuen	5,000 00	-	Ld. 24 00	-	-	-	5,000 00
Middleborough	2,897 27	-	-	-	-	-	2,936 92
Middlefield	113 73	-	-	-	-	-	140 94
Middleton	479 75	639 84	311 30	160 09	527 89	687 98	481 36
Millford	4,921 19	-	-	-	-	-	5,000 00
Millbury	1,857 01	-	-	-	-	-	2,189 15
Millis	848 38	-	-	-	-	-	1,038 34
Millville	546 37	-	-	-	-	-	668 31
Milton	5,000 00	-	-	-	-	-	5,000 00
Monroe	194 97	-	-	-	-	-	239 14
Monson	831 13	-	-	-	-	-	1,079 54
Montague	3,799 66	-	-	-	-	-	4,574 48
Monterey	206 84	-	-	-	-	-	232 76
Montgomery	78 27	-	-	-	-	-	100 35
Mount Washington	69 06	-	-	-	-	-	90 27
Nahant	1,735 84	-	-	-	-	-	2,091 84
Nantucket	2,852 66	-	-	-	-	-	2,472 30
Natick	4,016 60	-	-	-	-	-	5,000 00
Needham	4,742 59	-	-	-	-	-	4,934 64
New Ashford	36 55	-	-	-	-	-	48 54
New Bedford	5,000 00	-	-	-	-	-	5,000 00
New Braintree	210 50	-	-	-	-	-	231 64
New Marlborough	532 62	-	-	-	-	-	641 09
New Salem	231 75	-	-	-	-	-	246 44
Newbury	749 65	1,685 43	814 25	935 78	1,281 95	2,217 73	1,089 52
Newburyport	5,000 00	-	Ld. 635 70	-	-	-	5,000 00
Newton	5,000 00	-	-	-	-	-	5,000 00
Norfolk	557 75	760 20	259 75	202 45	293 05	495 50	629 89
North Adams	5,000 00	-	-	-	-	-	5,000 00
North Andover	3,086 00	397 04	127 00	-	-	-	4,173 28
North Attleborough	3,565 05	-	-	-	-	-	4,210 31
North Brookfield	915 68	-	-	-	-	-	1,074 89
North Reading	664 06	902 69	510 00	238 63	2,133 35	2,371 98	655 87
Northampton	5,000 00	-	-	-	-	-	5,000 00
Northborough	835 09	462 89	500 89	-	1,857 44	1,485 24	889 14
Northbridge	2,672 88	-	Ld. 284 13	-	-	-	4,949 85
Northfield	716 51	-	-	-	-	-	760 15
Norton	883 23	1,101 80	294 23	218 57	401 80	620 37	936 11
Norwell	584 06	1,034 49	1,052 24	450 43	915 25	1,365 63	642 47
Norwood	5,000 00	-	-	-	-	-	5,000 00
Oak Bluffs	1,298 62	-	-	-	-	-	1,226 88
Oakham	183 20	101 24	157 73	-	2 20	-	193 67
Orange	2,078 71	-	-	-	-	-	2,328 56
Orleans	692 46	904 43	759 14	211 97	606 93	818 90	698 50

CITIES AND TOWNS.	1923.						1924.
	Required Expenditures.	Total Net Expenditures.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditures.
Otis	\$169 50	-	-	-	-	-	\$177 12
Oxford	999 13	-	-	-	-	-	1,190 82
Palmer	4,371 09	-	-	-	-	-	4,605 41
Paxton	206 34	\$152 09	\$313 51	-	-	-	240 95
Peabody	5,000 00	-	-	-	-	-	5,000 00
Pelham	220 53	-	-	-	-	-	253 76
Pembroke	642 11	1,295 74 {	771 85 Ld. 572 00	\$653 63	\$1,252 68	\$1,906 31	634 63
Pepperell	1,186 47	1,377 46 {	303 04 Ld. 108 45	139 75	758 57	898 32	1,349 54
Peru	120 00	-	-	-	-	-	110 48
Petersham	576 33	318 15	112 15	-	-	-	618 14
Phillipston	149 53	298 72	61 70	149 19	-	149 19	165 17
Pittsfield	5,000 00	-	-	-	-	-	5,000 00
Plainfield	116 29	175 49	-	59 20	-	59 20	124 48
Plainville	489 69	924 57	155 80	434 88	352 87	787 75	751 24
Plymouth	5,000 00	-	-	-	-	-	5,000 00
Plympton	241 12	450 57 {	217 45 Ld. 112 00	209 45	251 21	460 66	261 37
Prescott	117 69	-	-	-	-	-	130 99
Princeton	533 40	677 45 {	108 19 Ld. 144 25	144 05	390 73	534 78	505 54
Provincetown	1,532 27	-	-	-	-	-	1,683 30
Quincy	5,000 00	-	-	-	-	-	5,000 00
Randolph	1,278 18	-	-	-	-	-	1,412 86
Raynham	582 95	754 43	475 15	171 48	446 55	618 03	580 95
Reading	3,944 08	-	-	-	-	-	4,221 89
Rehoboth	690 46	-	-	-	-	-	703 28
Revere	5,000 00	-	-	-	-	-	5,000 00
Richmond	247 22	-	-	-	-	-	269 50
Rochester	440 47	756 85	-	316 00	521 55	837 55	515 84
Rockland	2,685 13	-	-	-	-	-	3,103 36
Rockport	1,904 51	-	-	-	-	-	2,055 83
Rowe	108 42	193 47	12 00	-	-	-	142 58
Rowley	468 00	1,535 71 {	458 00 Ld. 262 64	1,067 71	738 67	1,806 38	531 27
Royalston	415 88	-	-	-	-	-	508 85
Russell	1,060 73	-	-	-	-	-	1,481 77
Rutland	422 19	160 28	159 13	-	-	-	492 11
Salem	5,000 00	-	-	-	-	-	5,000 00
Salisbury	1,031 89	734 82 {	615 81 Ld. 71 37	-	884 74	587 67	1,062 69
Sandisfield	223 47	-	-	-	-	-	220 85
Sandwich	681 98	1,091 15 {	75 20 Ld. 202 76	409 17	1,226 76	1,635 93	718 47
Saugus	3,584 67	-	-	-	-	-	3,615 83
Savoy	97 69	-	-	-	-	-	114 40
Scituate	3,216 19	-	-	-	-	-	3,150 24
Seekonk	1,314 92	-	-	-	-	-	1,096 24
Sharon	1,606 54	-	-	-	-	-	1,651 94
Sheffield	466 61	-	-	-	-	-	664 63
Shelburne	954 13	-	-	-	-	-	1,039 02
Sherborn	722 50	806 76	800 27	84 26	899 25	983 51	813 47
Shirley	753 97	756 89	155 50	-	653 29	653 29	992 28
Shrewsbury	2,112 02	1,455 65 {	427 90 Ld. 134 25	-	-	-	2,069 06
Shutesbury	156 01	30 35	14 45	-	-	-	180 98
Somerset	1,197 13	-	-	-	-	-	1,245 93
Somerville	5,000 00	-	-	-	-	-	5,000 00
South Hadley	2,311 73	-	-	-	-	-	2,542 59
Southampton	319 10	514 16	85 14	-	-	-	329 42
Southborough	1,172 95	1,222 28 {	623 38 Ld. 38 12	-	1,739 57	1,739 57	1,373 10
Southbridge	4,595 52	-	-	-	-	-	5,000 00
Southwick	476 56	-	-	-	-	-	629 81
Spencer	1,587 32	-	-	-	-	-	1,772 59
Springfield	5,000 00	-	-	-	-	-	5,000 00
Sterling	612 73	712 10 {	54 69 Ld. 156 00	99 37	621 42	720 79	638 80
Stockbridge	2,267 34	-	-	-	-	-	2,433 19
Stoneham	3,289 26	-	-	-	-	-	3,294 15
Stoughton	2,544 05	-	-	-	-	-	2,655 28
Stow	638 85	603 61 {	360 50 Ld. 457 45	-	1,194 53	1,159 29	681 68
Sturbridge	492 50	247 40	-	-	-	-	559 55
Sudbury	678 35	670 03 {	150 55 Ld. 432 62	-	2,353 46	2,345 14	949 06

CITIES AND TOWNS.	1923.						1924.
	Required Expenditures.	Total Net Expenditures.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditures.
Sunderland	\$380 52	-	-	-	-	-	\$426 06
Sutton	733 68	-	-	-	-	-	942 75
Swampscott	5,000 00	-	-	-	-	-	5,000 00
Swansea	922 64	-	-	-	-	-	952 26
Taunton	5,000 00	-	-	-	-	-	5,000 00
Templeton	1,056 41	-	-	-	\$88 89	-	1,354 47
Tewksbury	1,209 84	\$2,194 40	\$687 51	\$984 56	1,354 87	\$2,339 43	1,270 39
Tisbury	1,029 79	690 48	56 50	-	532 74	193 43	1,038 03
Tolland	134 29	-	-	-	-	-	151 22
Topsfield	1,023 74	809 89	263 06 Ld. 56 75	-	471 08	257 23	1,196 62
Townsend	830 61	777 00	461 25	-	336 33	282 72	912 39
Truro	253 55	329 67	111 00	76 12	212 97	289 09	295 94
Tyngsborough	414 25	1,409 08	745 58	994 83	1,055 36	2,050 19	413 76
Tyringham	154 03	-	-	-	-	-	201 43
Upton	580 82	-	-	-	-	-	653 02
Uxbridge	2,530 05	-	-	-	-	-	2,863 14
Wakefield	5,000 00	-	-	-	-	-	5,000 00
Wales	147 30	-	-	-	-	-	177 56
Walpole	3,630 55	-	-	-	-	-	3,875 00
Waltham	5,000 00	-	-	-	-	-	5,000 00
Ware	2,915 47	-	-	-	-	-	3,271 36
Wareham	3,425 84	-	-	-	-	-	3,516 97
Warren	1,687 61	176 00	-	-	-	-	1,939 81
Warwick	197 37	-	-	-	-	-	235 25
Washington	88 82	-	-	-	-	-	144 54
Watertown	5,000 00	-	-	-	-	-	5,000 00
Wayland	1,654 01	847 70	576 30 Ld. 129 00	-	* 1,067 17	260 86	1,733 70
Webster	3,955 26	-	-	-	-	-	5,000 00
Wellesley	5,000 00	-	-	-	-	-	5,000 00
Wellfleet	375 36	512 96	196 45 Ld. 5 72	137 60	326 59	464 19	424 25
Wendell	290 50	-	-	-	-	-	403 79
Wenham	1,115 00	844 80	489 08	-	415 35	145 15	1,291 66
West Boylston	606 62	340 01	400 45 Ld. 117 88	-	486 13	219 52	556 64
West Bridgewater	902 10	1,613 21	674 63 Ld. 63 18	711 11	2,042 41	2,753 52	895 45
West Brookfield	447 70	-	-	-	-	-	570 45
West-Newbury	446 70	416 21	313 28 Ld. 156 78	-	651 89	621 40	472 22
West Springfield	5,000 00	-	-	-	-	-	5,000 00
West Stockbridge	380 31	-	-	-	-	-	400 68
West Tisbury	252 42	-	-	-	-	-	272 81
Westborough	1,561 96	921 34	670 16	-	600 46	-	1,659 34
Westfield	5,000 00	-	-	-	-	-	5,000 00
Westford	1,287 67	1,355 94	661 75 Ld. 600 00	-	1,482 79	1,482 79	1,929 04
Westhampton	128 21	171 55	45 84	43 34	-	43 34	149 47
Westminster	483 23	432 82	344 55 Ld. 160 94	-	393 46	343 05	520 63
Weston	2,415 90	793 26	-	-	811 33	-	2,585 58
Westport	1,871 41	-	-	-	-	-	1,984 97
Westwood	1,157 89	-	-	-	-	-	1,241 34
Weymouth	5,000 00	-	-	-	-	-	5,000 00
Whately	366 41	121 00	-	-	-	-	433 39
Whitman	2,574 45	-	-	-	-	-	2,862 98
Wilbraham	928 87	-	-	-	-	-	1,129 34
Williamsburg	503 08	-	-	-	-	-	646 08
Williamstown	2,175 61	-	-	-	-	-	2,510 54
Wilmington	1,045 35	1,660 46	649 22	615 11	1,776 75	2,391 86	1,058 48
Winchendon	2,042 03	1,836 18	239 46	-	6 69	-	2,565 40
Winchester	5,000 00	-	-	-	-	-	5,000 00
Windsor	152 95	-	-	-	-	-	171 37
Winthrop	5,000 00	-	-	-	-	-	5,000 00
Woburn	5,000 00	-	-	-	-	-	5,000 00
Worcester	5,000 00	-	-	-	-	-	5,000 00
Worthington	184 87	189 22	-	-	-	-	226 15
Wrentham	846 39	-	-	-	-	-	877 50
Yarmouth	902 43	1,036 22	416 56	220 34	776 53	996 87	1,041 58